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Atty. Docket No.: P66652US0

REMARKS

The Office Action mailed December 29, 2003, has been carefully reviewed and Applicants note with appreciation the identification of allowed subject matter.

By this Amendment, reconsideration of the pending claims 14 and 16-25 is respectfully requested. Claims 14 and 16-27 are pending in the application; claims 26 and 27 are allowed. Claims 14, 20 and 26 are the independent claims.

The Examiner rejected claims 14, 17, 20-24 under 35 U.S.C. 103(a) as being unpatentable over WO 98/50091 in view of "Hemodialysis Machines and Monitors" by Polaschegg et al. ("Polaschegg"). The Examiner further rejected claim 16 as being unpatentable over WO 98/50091 in view of Polaschegg and further in view of Pedrini et al. ("Pedrini"), and rejected claim 25 as being unpatentable over WO 98/50091 in view of Polaschegg and further in view of German Patent No. 4240681. The Examiner objected to claims 18 and 19 as being dependent upon a rejected base claim, but stated that these claims would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

As an initial matter, when discussing or referring to WO 98/50091 in response to the above rejections, Applicants'

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references to page numbers and line numbers and/or paragraphs are made with reference to the English translation of WO 98/50091 provided to the Examiner with Applicants' Amendment of October 30, 2003.

The Examiner states that WO 98/50091 teaches a method and device for controlling a blood purifying device wherein a control unit adjusts the instantaneous flow rates of blood, ultrafiltrate and the substitution products by monitoring the substitution pumps upstream and downstream of the blood purifying device. In support of this statement, the Examiner cites the abstract and Figure 1 of WO 98/50091. However, the abstract specifically identifies only the blood pump 1 and, in connection with the control of instantaneous flow rates of blood, ultrafiltrate and the substitution products, the abstract refers to "the pumps", not the "substitution pumps". This is significant in that neither blood flow rate nor ultrafiltrate rate are controlled by the substitution pumps 2, 3; rather, blood pump 1 controls the blood flow rate (see page 5, lines 4-7), and ultrafiltrate pump 4 controls the ultrafiltrate rate (see page 5, lines 12-13). The flow rates of these two pumps 1, 4 are adjusted in order to create the desired pressure differential between the compartments 8a, 8b necessary for filtration (see page 10, first full paragraph). Thus, contrary to the Examiner's

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overly general summarization of WO 98/50091, there is nothing in WO 98/50091 that teaches the adjustment of blood flow rate and ultrafiltrate rate by monitoring the substitution pumps 2, 3. Rather, the only parameter that is controlled by adjustment of the substitution pumps is the substitution flow rate itself.

Consequently, contrary to the Examiner's conclusion that the only difference between the present invention and WO 98/50091 is that the present invention recites the operational and/or blood parameters of TMP, blood density and/or HKT, as well as the associated sensors, in fact WO 98/50091 fails to disclose the more fundamental aspect of the present invention, namely adjusting the flow rates of the substitution fluids in order to control the operational and/or blood parameters of TMP, blood density and/or HKT.

The Examiner further states on page 1 of the Office Action that, "Controlling ultrafiltrate amount is closely correlated to the adjustment of substitution fluid input." This assertion has no basis in the prior art. Instead, WO 98/50091 discloses controlling the ultrafiltrate rate with pump 4 and controlling the blood flow rate with pump 1; WO 98/50091 does not teach or suggest adjustment of the substitution fluid input to adjust the ultrafiltrate amount.

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The Examiner's finding of a correlation in WO 98/50091 between controlling ultrafiltrate amount and adjusting substitution fluid input provides the basis, however, for a further extrapolation. Specifically, in the latter part of page 1, the Examiner seems to be arguing that ultrafiltration rate is correlated to TMP, HKT and blood density. Then, on the basis of the earlier statement that "[c]ontrolling the ultrafiltrate amount is closely correlated to the adjustment of the substitution fluid input", a link is constructed between controlling TMP, HKT and blood density and adjustment of the substitution fluid rates. There is, however, no basis for this linkage or the conclusion.

First, nothing in WO 98/50091 states or suggests that the ultrafiltrate amount can be controlled by adjustment of the substitution fluid rate. Second, controlling the ultrafiltration rate is not equivalent to controlling TMP, HKT and blood density.

Polaschegg does not assert that controlling the ultrafiltration rate is equivalent to controlling TMP, HKT and blood density but merely recites that ultrafiltration can be controlled by the TMP (figure 20) and further that blood density and HKT increase with reduction of water in the blood (figure 30). But using TMP to control ultrafiltration is not the same as adjusting substitution fluid flow rates to control TMP. Nor is

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recognizing a reduction in water space on the basis of increased HKT or blood density, as taught by Polaschegg (figure 30), the same as adjusting the substitution fluid flow rates to specifically control HKT or blood density.

Further, there is nothing to suggest modifying WO 98/50091 to incorporate blood sensors such as those of Polaschegg for determining TMP, HKT and blood density. As more fully set forth in Applicants' Amendment filed October 30, 2004, WO 98/50091 is directed to a method for monitoring the operation of various pumps and scales within a blood purifying device by weighing first and second substitution products contained in reservoirs 15, 16, as well as the ultrafiltrate extracted from the blood and collected in container 17 (see page 11, last paragraph). Based on differences between actual values from the scales 5, 6, 7 and theoretical values which should be obtained for each of the respective pumps, the operational status of the pumps is determined. There is no measurement of an operational and/or blood parameter value as measured within the blood, and no subsequent adjustment of substitution fluid flow rates, as claimed by the present invention.

Moreover, WO 98/50091 has predefined user-selected treatment choices that allow the user to specify the duration of treatment, the quantity of ultrafiltrate to extract, or the

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quantity of substitution product to add (see page 12, last paragraph). While the WO 98/50091 system verifies that the user has not specified an excessively high quantity of substitution fluid, as measured against medical knowledge recorded in a memory 12, there is no disclosed relationship between the quantity of substitution product specified by the user and the actual measured blood parameters of TMP, HKT and blood density.

Clearly, WO 98/50091 does not teach or suggest the control system of the present invention in which one of a specified operational and/or blood parameter is measured *within* the blood and the parameter value thereof controlled through adjustment of the infusion rates of the substitution fluid within pre- and post-substitution fluid supply lines. Nor is there anything in WO 98/50091 or Polaschegg which would suggest modifying WO 98/50091 to include sensors for measuring TMP, HKT or blood density.

As just explained, WO 98/50091 relies upon the measured and theoretical weights of first and second substitution fluids, as well as the weight of ultrafiltrate extracted, to monitor the operation of pump devices within a hemofiltration system (see page 4, last paragraph, through first full paragraph on page 6).

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There is no incentive to add sensors to measure TMP, HKT or blood density as such sensors would be wholly superfluous. There is no reason why a person of ordinary skill in the art would have any motivation to incorporate sensors, for detecting specified blood parameters, within a system that relies upon the comparison of actual weight of substitution products and ultrafiltrate with theoretical weight values in order to monitor pump operation. There is nothing in the prior art that provides motivation for such a modification when the existing system of WO 98/50091 is simpler and achieves the intended goal; there is no benefit to be obtained by incorporating such blood sensor components.

Furthermore, there is nothing in WO 98/50091 or Polaschegg to suggest how a system that dynamically adjusts the infusion rates of substitution fluid to control TMP, HKT and blood density, as presently claimed, could be logically obtained by combining the Polaschegg sensors with the WO 98/50091 system that allows the user to arbitrarily specify substitution fluid quantity. The resulting incompatibility of dynamic adjustment and user definition teaches against the so-termed obviousness of combining Polaschegg with WO 98/50091 to arrive at the present invention. And further, as already explained, Polaschegg does not even teach the adjustment of infusion rates of substitution fluid to control TMP, HKT and blood density.

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For at least the foregoing reasons, claims 14 and 20 are not shown or suggested by WO 98/50091, either alone or in combination with Polaschegg, and are patentable thereover. Claims 16-19 and 21-25 are also in condition for allowance as claims properly dependent on an allowable base claim and also for the subject matter contained therein. Claims 26 and 27 are already allowed.

Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

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Date: March 29, 2004
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